

REMARKS

The Examiner's attention to this application is appreciated. Reconsideration is respectfully requested.

Claims 2-43 are pending in the application.

Claims 1-2 have been cancelled without prejudice.

Claim 3 has been amended to present the subject matter thereof in independent form, which had been previously dependent on originally-filed claims 1-2, and to clarify that which the Applicant regards as the invention, including to clarify the definition of "hydrophobically-modified RPM" and that the hydrophobic compound is an alkyl halide having an alkyl chain length of 6 to 22 carbons.

Claim 25 has been amended to present the allowable subject matter of claim 31/25/1 in independent form, including all the limitations of the base claim and any intervening claims.

Claim 31, which had been originally multiply dependent on claim 3 or claim 25, has been amended to depend solely from claim 3, because the subject matter of Claim 31/25/1 has been presented separately in amended claim 25.

Claim 32, which had been originally dependent on claim 31, has been amended to multiply dependent from claim 25 or claim 31.

Claim 35 has been amended to clarify that which the Applicant regards as the invention, including to clarify the definition of "hydrophobically-modified RPM" and that the hydrophobic compound is an alkyl halide having an alkyl chain length of 6 to 22 carbons.

Claim 37 has been amended to correct the dependency to claim 35 instead of claim 3, which was a typographical error in the original claim 37.

Claim 38 has been amended to clarify that which the Applicant regards as the invention, including to clarify the definition of "hydrophobically-modified RPM" and to provide a Markush grouping for the hydrophobically-modified hydrophilic monomer.

Claim 41 is new, dependent from Claim 38, to provide a Markush grouping for the hydrophilic monomer.

Claims 42-43 are new, which have been added to present the allowable subject matter of original dependent claim 30.

No new matter has been added.

Claim Objections

Original claim 1 was objected to because “RPM” is a very common acronym typically used for “revolutions per minute.” In response to this objection, Applicant has amended independent claims 3, 25, 35, 38 to state the definition of “hydrophobically-modified RPM.” The same definition was also used in new independent claim 41. Support for this amendment is found in the specification, for example, in paragraph 18.

Claim Rejections – 35 USC § 102

Original claims 1-10, 14, 15, 18, 20-29, 33, and 35-40 were rejected under 35 U.S.C. 102(b) as being anticipated by Weaver (U.S. Patent No. 4,532,052) (“Weaver”).

Original independent claims 1 and 35 had included the limitation that “the hydrophilic polymer is a polymer containing reactive amino groups in the polymer backbone or as pendant groups, which are *capable* of reacting with a hydrophobic alkyl halide compound.” (*Emphasis added*). Independent claims 3 and 35 have been amended to clarify that “the hydrophobic compound is an alkyl halide having an alkyl chain length of 6 to 22 carbons.” (*Emphasis added*). Support for these amendments is found throughout the specification, for example, in paragraph 19. Weaver does not teach or suggest the invention as defined by the clarified independent claims 3 and 35.

Original claim 25 has been amended to present the allowable subject matter of claim 31/25/1 in independent form, including all the limitations of the base claim and any intervening claims.

Although claim 25 has been amended, the rejection of the subject matter of original claim 27 is respectfully traversed, and dependent claim 27 is believed to be separately and independently patentable over claim 25. Although the previous Office Action cited Weaver, column 19, line 36 – column 20, line 29, the cited text does not teach or suggest hydrophobically-modified hydrophilic monomers selected from the Markush grouping as defined in claim 27. In this section, Weaver discloses:

preferred polymer units which can be written –R–X– wherein
R is defined as [in Weaver] and X represents a hetero group
such as nitrogen, oxygen, or sulfur having at least two bonds.
... These –R–X– groups can be acrylate, acrylamide, vinyl
alcohol, methyl vinyl ether, a C₁-C₆ alkyl, aryl, combinations
thereof, or combinations thereof with hetero groups, especially
groups with a hetero atom as given above such as C₁-C₆ alkyl

with hetero group. ... Weaver, Column 19, lines 40-65.

Although C₁-C₆ is mentioned as being possible for part of the polymer units of the polymeric backbone, this does not refer to the length of the alkyl radical that is attached to pendant amino groups of that may be present in the polymer units. Reconsideration of this rejection is respectfully requested.

Independent claim 38 has been amended to include that “the hydrophobically-modified hydrophilic monomer is selected from the group consisting of alkyl acrylates, alkyl methacrylates, alkyl acrylamides and alkyl methacrylamides wherein the alkyl radicals have from about 4 to about 22 carbon atoms, alkyl dimethylammoniummethyl methacrylate bromide, alkyl dimethylammoniummethyl methacrylate chloride and alkyl dimethylammoniummethyl methacrylate iodide wherein the alkyl radicals have from about 6 to about 22 carbon atoms and alkyl dimethylammoniumpropyl methacrylamide bromide, alkyl dimethylammonium propylmethacrylamide chloride, and alkyl dimethylammoniumpropyl methacrylamide iodide, wherein the alkyl groups have from about 4 to about 22 carbon atoms.” Support for the subject matter of this amendment can be found in original claim 27 and in the specification, including, for example, in paragraph 54. As discussed above with respect to claim 27, Weaver does not teach or suggest the invention as defined by amended independent claim 38.

Claim Rejections – 35 USC § 103

Claims 1-10, 14, 15, and 18 were also rejected under 35 U.S.C. 103(a) as being unpatentable over Card et al. (U.S. Patent No. 5,979,557) (“Card”) in view of Weaver

As discussed above, Weaver does not teach or suggest a hydrophobically-modified RPM as defined in the pending claims. While Card teaches a method of limiting the inflow of formation water during a well turn around, in the absence of any teaching or suggestion of the particular compositions or methods of the present invention in Weaver, the hypothetical combination of Card and Weaver would not teach or suggest the inventions as defined by the pending claims 1-10, 14, 15, and 18 herein. Reconsideration of this rejection is respectfully requested.

Claims 11-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver in view of Szabo et al. (U.S. Patent No. 3,744,566) (“Szabo”) or as being unpatentable over Card in view of Weaver and further in view of Szabo. These rejections are respectfully traversed.

Weaver makes no differentiation between the reactivity by and/or between “one or

more” of at least 12 chemical groups, plus “similar or equivalent reactive groups.” This indiscriminately presents a large number of possible reactions between just the 12 listed chemical groups, let alone what might be considered “similar or equivalent reactive groups.” For example, Weaver does not teach or suggest using any specific reaction among the numerous possible combinations, or even any basis for making such a selection, or what specific advantages, if any, might be obtained by selecting any one of these broad chemical classes. In contrast, Applicant teaches using alkyl halides for the purpose of hydrophobically modifying a hydrophilic polymer or hydrophilic monomers reactive amino groups in the polymer backbone or as pendant groups.

Further, Weaver makes no differentiation between any species of the entire class of each chemical group. For example, Weaver does not teach or suggest any basis for selecting any particular alkyl halides. In contrast, Applicant discloses a much more limited subclass of the entire class of alkyl halides, i.e., alkyl halides having 6-22 carbons, and the reason for using the longer chain alkyl halides is to provide an alkyl radical to hydrophobically modify a hydrophilic polymer or hydrophilic monomer.

It is unfair to select an isolated statement of broad chemical reactivity of gigantic classes of chemical compounds as being any kind of specific teaching or suggestion of the more limited class of alkyl halides disclosed by the Applicants.

Similarly, Szabo teaches that as just one part of a lengthy chemical formula:

“R_z” may be any group capable of quaternizing the nitrogen [of a chemical according to a specific formula], including the group consisting of hydrogen, benzyl, phenethyl, cyanoethyl, and linear, branched and substituted alkyl and aralkyl groups having one to 16 carbon atoms, the substitutions being halide, -OH, -COO⁻, and -SO₃⁻, where the counter ion for the anionic is normally hydrogen or alkali metal; “X-” may be any anion, preferably halide, alkylsulfate, tosylate, carboxylate, sulfonate, sulfate, phosphate, acetate, or nitrate, Szabo, column 3, lines 35 – column 4, line 10.

Szabo does not teach or suggest anything specific in relation to Applicant’s invention as defined in claims 10-11.

Further, Szabo makes no differentiation between the entire class of alkyl halides having 1-16 carbons versus the much more limited class that Applicant discloses, i.e., alkyl halides having 6-22 carbons. For example, Szabo does not teach or suggest any basis for

selecting any particular type of alkyl halides. In contrast, Applicant discloses a much more limited subclass of the entire class of alkyl halides, i.e., alkyl halides having 6-22 carbons, and the reason for using the longer chain alkyl halides is to provide an alkyl radical to hydrophically modify a hydrophilic polymer or hydrophilic monomer.

In addition, Applicant respectfully notes that contrary to the statement in the Office Action, Szabo does not teach or suggest “a hydrophobic compound that is an alkyl halide having an alkyl chain length of one to 16 carbon atoms capable of quaternizing a homopolymer of dimethylaminoethyl methacrylate (DMAEMA).” Office Action, paragraph 6, page 11. In fact, Szabo discloses quaternizing monomers according to the specific formula disclosed in Column 3, lines 35 – Column 4, line 10. Szabo then discloses that: “The monomer may be copolymerized with any copolymerizable water-soluble monomer. ...” Column 4, lines 11 – 26. Szabo does not teach or suggest quaternizing these other monomers.

Further, Szabo states that: “We may also use the amine form of the above formula, i.e., where ‘Rz’ is not present and an associated ion is not necessary.” Further, the Szabo’s two independent claims 1 and 8 claim the specific formula for a monomer of a polymer that is quaternized and non-quaternized, respectively. This demonstrates that Szabo does not teach or suggest any correlation between quaternization of the monomers with alkyl halide having an alkyl chain length of one to 16 carbon atoms according to the specifically disclosed formula to its statement that: “Resistance factors obtained with a preferred copolymer were higher than those obtained with a commercial hydrolyzed polyacrylamide in a comparative test.” At best, Szabo attributes the resistance factors to the specifically defined monomer defined disclosed in Column 3, lines 35 – Column 4, line 10, quaternized with alkyl halide or not.

Applicant respectfully argues that there is no teaching or suggestion of Applicant’s invention in either of the cited references and there is no teaching or suggestion or motivation to make the hypothetical combination of Weaver and Szabo to achieve Applicant’s invention as defined in any of claims 10-13. The same argument applies to making the hypothetical combination of Card in view of Weaver and further in view of Szabo. Reconsideration is respectfully requested.

In view of the amendments to the claims and in view of the above arguments with respect to what Weaver does not teach or suggest, Applicant further argues that each of the other hypothetical combinations of Weaver (with or without Card) with Stahl et al., Harris, or Dawson et al. do not teach or suggest the inventions of claims 16 and 17, claim 19, or claim

34, respectively, and that each of these claims is separately and independently patentable.

Allowable Subject Matter

Applicant has presented the subject matter of Claim 30 as new claims 42-43, including all the limitations of the base claim and any intervening claims.

The subject matter of Claim 31/25/1 has been presented separately in amended claim 25, including all the limitations of the base claim and any intervening claims.

The Examiner also stated the subject matter of original claim 32 is patentable. Claim 32, which had been originally dependent on claim 31, has been amended to multiply dependent from claim 25 or claim 31.

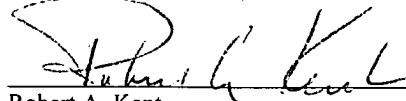
Conclusion

Applicant believes pending claims 3-42 are patentable and in condition for allowance, and such action is respectfully requested. If a telephone conference would expedite the prosecution of this application, the undersigned can normally be reached during business hours at the telephone number below.

Petition for an Extension of Time of one month is respectfully made to respond to the outstanding office action. Please charge the fee for this Petition to Deposit Account No. 08-0300 (Reference Number 2002-IP-007945).

The Commissioner of Patents is hereby authorized to charge any fees or overpayments to Deposit Account No. 08-0300. A duplicate copy of this fee authorization sheet is enclosed for this purpose.

Respectfully submitted,



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